

REMARKS

The Office Action dated May 22, 2003 has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto. Claims 12-22 have been withdrawn from consideration. Accordingly, claims 1-11 and 23 are pending in this application and are submitted for consideration.

Claim 5 was objected to under 37 C.F.R. § 1.75 as being a substantial duplicate of claim 4. Claim 7 was objected to under 37 C.F.R. § 1.75 as being a substantial duplicate of claim 6.

However, upon review of Applicants' specification and the claims, claim 4 recites that when the vehicle turns right, the first electromagnetic clutch is engaged and the first armature is urged leftward, thereby reducing an air gap between the first armature and the core. Claim 5 recites that the first armature is urged leftward, thereby reducing power consumption of the first electromagnetic clutch. Claims 6 and 7 recite similar language with respect to when the vehicle turns left and the second electromagnetic clutch is engaged. Therefore, Applicants request that the rejection be withdrawn.

Claims 1-11 and 23 were rejected under 35 U.S.C. § 112, second paragraph as being indefinite.

Specifically, the Office Action took the position that claims 1 and 23 are inaccurate regarding the function of the clutches. The Office Action asserted that the clutches do not transmit torque between the left and right output shafts, and concluded that the clutches serve to selectively brake the sun gear 19 or carrier 11 to the housing 20.

However, Applicants respectfully submit that the subject matter of claims 1 and 23 is clearly supported.

For example, at page 8, paragraph [0037] of Applicants' specification, it is described that when the rotational speed NR of the right front wheel WFR is increased relative to the rotational speed NL of the front left wheel WFL, a proportion of the torque of the front left wheel WFL which is the inner turning wheel, can be transmitted to the front right wheel WFR, which is the outer turning wheel. Similarly, at page 9, paragraph [0040], it is described that when the rotational speed NL of the front left wheel WFL increases relative to the rotational speed NR of the front right wheel WFR, a proportion of the torque of the front right wheel WFR, which is the inner turning wheel, can be transmitted to the front left wheel WFL. This relationship is further explained in paragraph [0052] of Applicants' specification.

Claim 8 is also rejected because the Office Action asserted that claim 8 is correct only when the clutch CL is engaged.

However, Applicants disagree. Firstly, the rejection is unclear as the claim does not state that a carrier member is directly connected to the housing. Therefore, Applicants submit that the claimed recitation is broad, not indefinite. Additionally, upon review of Applicants' specification, generally at page 6, paragraph [0030], it is stated that sun gear 19 can be connected to housing 20 via right electromagnetic clutch CR, and the rotational speed of carrier member 11 is increased by engagement of the right electromagnetic clutch CR. The carrier member 11 can be connected to the housing also via left electromagnetic clutch CL and the rotational speed of the carrier member 11 is reduced by engagement of the electromagnetic clutch CL.

The Office Action further asserted that the limitations of claims 8-11 regarding the relative speed of the carrier in the right output shafts, and the right and left wheels is unclear. The Office Action concludes that the function is not a result of the clutch, but rather is dependent on the combination of the clutches together with the gear arrangement which is not being claimed.

However, Applicants again respectfully submit that this rejection is unclear. It appears that it is being asserted that the claim is incomplete. However, the Examiner has not made that position apparent. Additionally, in reviewing a patent application, the Examiner must review the claims in light of the specification. Therefore, when reviewing paragraphs [0030] and [0040] of Applicants' specification, Applicants submit that these claims are not indefinite.

Accordingly, it is respectfully requested that the rejections be withdrawn.

Claims 1-12 and 23¹ were rejected under 35 U.S.C. § 102(b) as being anticipated by Gustin (U.S. Patent No. 5,545,103). However, Applicants respectfully submit that claims 1-11 and 23 recite subject matter that is neither disclosed nor suggested in Gustin.

In making this rejection, the Office Action took the position that Gustin discloses all of the elements of the claimed invention. However, it is respectfully submitted that the prior art fails to disclose or suggest the structure of the claimed invention, and therefore, fails to provide the advantages of the present invention. For example, the electromagnetic clutch structure of the present invention is configured to include an electromagnetic clutch structure in a driving force distribution system that includes a first

¹ The Office Action inadvertently stated that claims 1-12 and 23 were rejected. However, claim 12 is withdrawn.

electromagnetic clutch that transmits torque from a right output shaft connected to a right driven wheel to a left output shaft connected to a left driven wheel, and a second electromagnetic clutch that transmits torque from the left output shaft connected to the left driven wheel to the right output shaft connected to the right driven wheel, selective operation of the first and second electromagnetic clutches transmitting torque from the output shaft that is on the inside of a turn to the output shaft that is on the outside of the turn, wherein the first electromagnetic clutch includes an armature placed on the right side of a core housing a coil, and wherein the second electromagnetic clutch includes an armature placed on the left side of the core housing a coil.

As a result of the claimed configuration, when a vehicle turns right, the first electromagnetic clutch is engaged so as to assist the turn by transmitting torque from the right driven wheel that is on the inside of the turn to the left driven wheel that is on the outside of the turn. Since the first electromagnetic clutch is provided with the armature on the right side of the core housing the coil, the armature is urged leftward due to a centrifugal force caused by turning right to reduce an air gap, thereby enhancing the responsiveness of engagement of the first electromagnetic clutch as well as reducing the power consumption. When the vehicle turns left, the second electromagnetic clutch is engaged so as to assist the turn by transmitting torque from the left driven wheel that is on the inside of the turn to the right driven wheel that is on the outside of the turn. Since the second electromagnetic clutch is provided with the armature on the left side of the core housing the coil, the armature is urged rightward due to a centrifugal force caused by turning left to reduce an air gap, thereby enhancing the responsiveness of engagement of the second electromagnetic clutch as well as

reducing the power consumption.

Gustin discloses a vehicle transfer case with dual electrically hyphenated actuated magnetic clutches. As shown in Fig. 1, the power train includes engine 11 having output shaft 12 connected to a transmission 13 through rotary output shaft 14, which serves as input to the transfer case 10. Transfer case 10 operates to rotate rear drive shaft 15, which is connected to differential 16 of rear drive axle 17. Transfer case 10 is also operable to rotate front drive shaft 18 connected to differential 19 of front drive axle 20. Axles 17 and 20 act to drive rear wheels 21 and front wheels 22. As shown in Fig. 3, transfer case 10 is shown with two selectively engageable and disengageable clutches 45, 46. In two-wheel drive mode, coils 55 and 73 of clutches 45 and 46, respectively, are deenergized. Clutch 45 is disengaged and is incapable of transmitting torque from sleeve 43 to cup 51 and front axles 20. Permanent magnet 85 of clutch 46 causes clutch 46 to be engaged so that discs 67 prevent ring gear 40 from rotating relative to sleeve 43 relative to sun gear 42. With ring gear 40 and sun gear 42 of differential 35 being locked against relative rotation, driving the carrier 36 of the differential by the input shaft 24 causes planet gears 39 to rotate ring gear as a unit with the sun gear in the sleeve. The ring gear acts through output shaft 25 to drive rear axle 17 to propel vehicle with only its rear wheels.

In four-wheel drive mode, coils 55 and 73 of clutches 45 and 46, respectively, are both energized. Clutch 45 is engaged and clutch 46 is disengaged. As a result of the engagement of clutch 45, discs 45 couple sun gear 42 and sleeve 43 to cup 51 so that the driving of sprocket 28 in front axles 20 is effective. Disengagement of clutch 46 unlocks ring gear 40 from sun gear 42 and sleeve 43. During driving of carrier 36 by

input shaft 24, planet gears 39 act through ring gear 40 and output shaft 25 to drive rear axles 17, and at the same time, act through sun gear 42, sleeve 43 and clutch 45 to drive front axles 20. Approximately 70% of available torque is transmitted to rear axles and approximately 30% to the front axles.

When transfer case 10 is in four-wheel drive mode, center differential 35 accommodates speed variations between rear wheels 21 and front wheels 22, and allows all four wheels to be driven without torque fluctuations being transmitted from the drive shaft 15 to drive shaft 18, or vice versa, without excessive portional loading of the transfer case.

However, it is unclear where Gustin discloses that selective operation of the first and second electromagnetic clutches transmits torques from the output shaft on the inside of the turn to the output shaft on the outside of the turn, as recited in claim 1, or that the first electromagnetic clutch comprises a first armature placed on the right side of the core housing a first coil and the second electromagnetic clutch comprises a second armature placed on the left side of the core housing the second coil, as further recited in claim 1.

Furthermore, it is unclear as to where Gustin discloses that among the first electromagnetic clutch and the second electromagnetic clutch, the electromagnetic clutch operated when turning right comprises an armature placed on the right side of the respective coil, and the electromagnetic clutch operated when turning left comprises an armature placed on the left side of the respective coil, as recited in claim 23.

Therefore, it is respectfully submitted that the Applicants' invention, as set forth in claims 1 and 23, is not anticipated within the meaning of 35 U.S.C. § 102.

As claims 2-11 depend directly or indirectly from claim 1, Applicants respectfully submit that each of these claims incorporate the patentable aspects thereof, and are therefore allowable for at least same reasons as discussed above.

Claims 1-12 and 23 were rejected under 35 U.S.C. § 102(e) as being anticipated by Okuma et al. (U.S. Publication No. 2001/0035324 A1, "Okuma").

As will be discussed below, Applicants respectfully submit that claims 1-11 and 23 recite subject matter that is neither disclosed nor suggested by Okuma.

However, according to MPEP § 201.15, a priority claim can be perfected where the Applicants file a certified verified copy and translation of the foreign priority document. The foreign priority date of the present invention is January 12, 2001. The effective U.S. filing date of Okuma is March 27, 2001. The subject matter of claims 1-12 and 23 is disclosed in Japanese Patent Application No. 2001-4803. Therefore, Applicants hereby submit herewith a verified English translation of the foreign priority document, Japanese Patent Application 2001-4803, under 37 C.F.R. § 2.55(a). A certified copy of the priority document was filed with the present application, and was acknowledged in the Office Action dated March 18, 2003.

Therefore, it is respectfully submitted that the Applicants' invention, as set forth in claims 1 and 23 is not anticipated within the meaning of 35 U.S.C. § 102.

Additionally, because claims 2-11 depend either directly or indirectly from claim 1, Applicants respectfully submits that each of these claims incorporates the patentable aspects of claim 1, and are therefore allowable, for at least the same reasons. Therefore, Applicants request that the rejection be withdrawn.

In view of the foregoing, reconsideration of the application, withdrawal of the outstanding rejections, allowance of claims 1-11 and 23, and the prompt issuance of a Notice of Allowability are respectfully solicited.

If this application is not in condition for allowance, the Examiner is requested to contact the undersigned at the telephone listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing docket number 107348-00191.**

Respectfully submitted,

ARENT FOX KINTNER PLOTKIN & KAHN PLLC


Lynne D. Anderson
Attorney for Applicants
Registration No. 46,412

Customer No. 004372
1050 Connecticut Avenue, NW, Suite 400
Washington, DC 20036-5339
Telephone: (202) 857-6000

LDA:ksm/grs

Enclosure: Verified Translation of Priority Document and Declaration of Verification